User manual and Technical specifications

FOR

INBEEBOX RTU WITH INBEEBOX 22 CONTROLER VERSIÓN 1.0

MADE BY

VVAMIR LTD.

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1. Document reach.

This document will speak about the technical characteristics of the INBEEBOX Model INBEEBOX 22 version 1.0 controller.

2. Description

INBEEBOX Model INBEEBOX22 is a name given to a version of a controller that is part of an electro-mechanic group called INBEEBOX M2M.

INBEEBOX M2M permits supervising and controlling process variables on a distance, proportioning communication with the field devices and controlling the process automatically with software specially tweaked for each case.

INBEEBOX M2M is a Remote Terminal Unit that consists of a particularly chosen for each project and the task at hand controller. The final design features deliver industrial Programmable Logic Controller (PLC), and at a logger, DVR /NVRIP cameras integrated, programmable automation controller (PAC) and several communication modules.

M2M INBEEBOX communicates with instruments and local elements through different physical ports and allows local control of intelligent field operations. The driver version defines the following:

- Multiple CPU's
- Operative system
- Memory
- Communication ports
- Communication methods
- Inputs and outputs
- Energetic consumption
- Other characteristics

3. Technical characteristics Model INBEEBOX 22 V1.0:

This model is the most complete, integrated signal router and hub for Ethernet or serial ports, USB Type A, web server, database SQLite data base type, strong and reliable engine logic inputs and outputs, very low power consumption.

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3.1 Multiple CPU's:

3.1.1 ARM1176JZF-S (PI):

Linux operative system, C programmation handles complex logic, WEB server, USB, Ethernet, RS232 Port.

- Controller: ARM11 32bit RISC 700MHz, Linux OS. Suspended mode for low power consumption.
- Memory: RAM 512MB Protected by battery, µSD Card 1/2/4/8/16/32GB
  Clock: Real-time clock provides a full schedule, programmable alarm clock periodically/interruption

3.2 Additional communication ports:

- 1 x RS232
- Ethernet RJ45 10/100Mbps
- USB type A
- HDMI

3.3 Inputs and Outputs:

- Digital inputs
  - 8 DI

- Digital outputs
  - 4 DO open collector 250ma
  - 1 DO NO/NC Relay

- 12 Bit Analog inputs
  - 2 AI,0-15VDC, 12bit
  - 2AI,4-20mA, 12bit

3.4 Communication:

- Dual SIM Mobile Modem, low power, RoHS, GSM, GPRS, EDGE, 3G, UMTS, HSPA, (Optional LTE). Supports programming in Python (third CPU)
- Optional: cellular modem, low consumption, RoHS, GSM, GPRS, EDGE, 3G, UMTS, HSPA,(Optional LTE). Supports programming in Python (fourth CPU)
- Optional: RF Module 868MHz
- Optional: WIFI Module, ZIGBEE, Bluetooth,

3.5 Energy & power:

- Power: 6 – 55 VDC
- Optional: Lithium battery3.3 – 4.2VDC, typical 3.7VDC
- Data transmission mode (average) 600mA

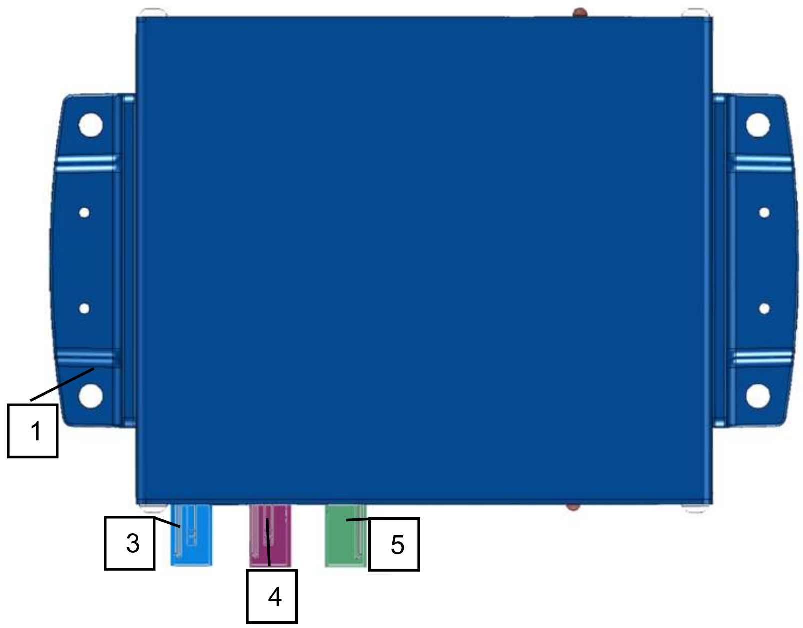
3.6 Additional characteristics:

- Movement vibration and inclination sensor

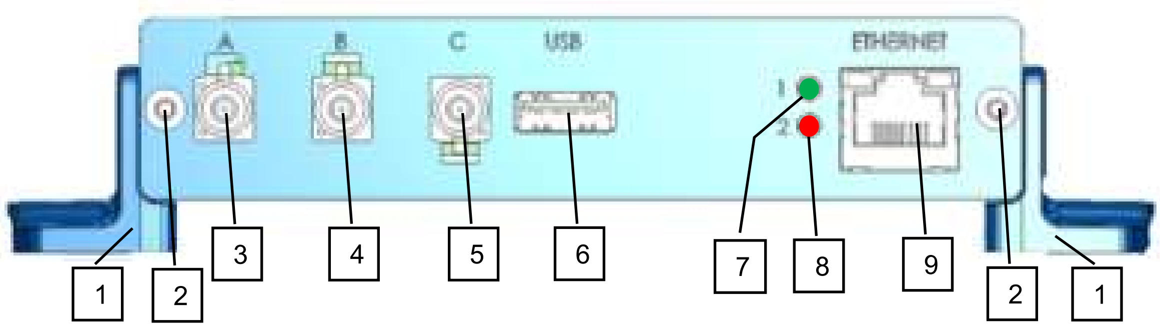
4. General view INBEEBOX model 22 V1.0

4.1 Wall or omega rail support (DIN)
4.2 Screws to remove panels
4.3 GPS connector type Fakra
4.4 GPRS connector type Fakra
4.5 Optional modules connector
4.6 USB port type A
4.7 Green LED Linux CPU
4.8 Red LED cellular modem
4.9 Ethernet connector RJ45
4.10 Power connector
4.11 Mini connectorRS485
4.12 Red LED
4.13 Green LED
4.14 Molex connector 24
4.15 Reset button
4.16 DB9 RS232 connector

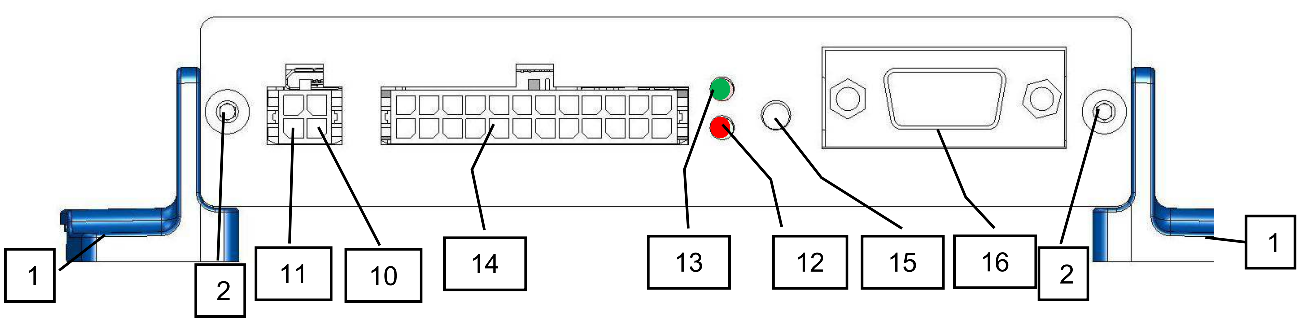
Top view



Front view



Back view



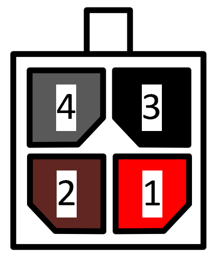
5. Connectors INBEEBOX Model INBEEBOX22 V1.0

5.1 J1 - Power y RS485

INBEEBOX Model 22 is powered by a power cable with a connector type Molex 4 pines, which is connecter by the rear panel

Pin Layout J1 – Power y RS485

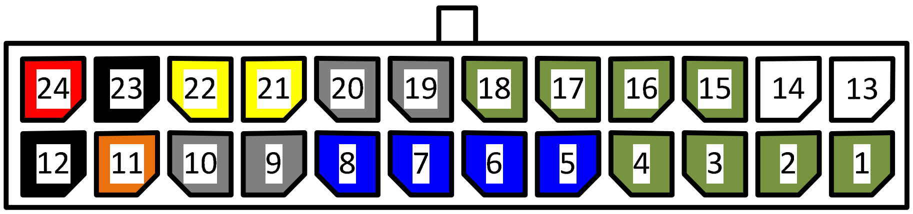
Pin	Name	Color	Comment
1	VIN+	RED	6 - 55VDC
2	RS485A	BROWN	For PIC use can be controlled by linux
3	VIN-	BLACK	
4	RS485B	GRAY	For PIC use can be controlled by linux



NOTE: VIN is protected by over voltage up to 60VDC and inversed polarity

5.2 Molex 24

INBEEBOX Model 22 Digital Inputs & outputs are located in the Molex 24 pins connector that is connected by the rear panel.



Pin Layout Molex 24– INPUTS & OUTPUTS

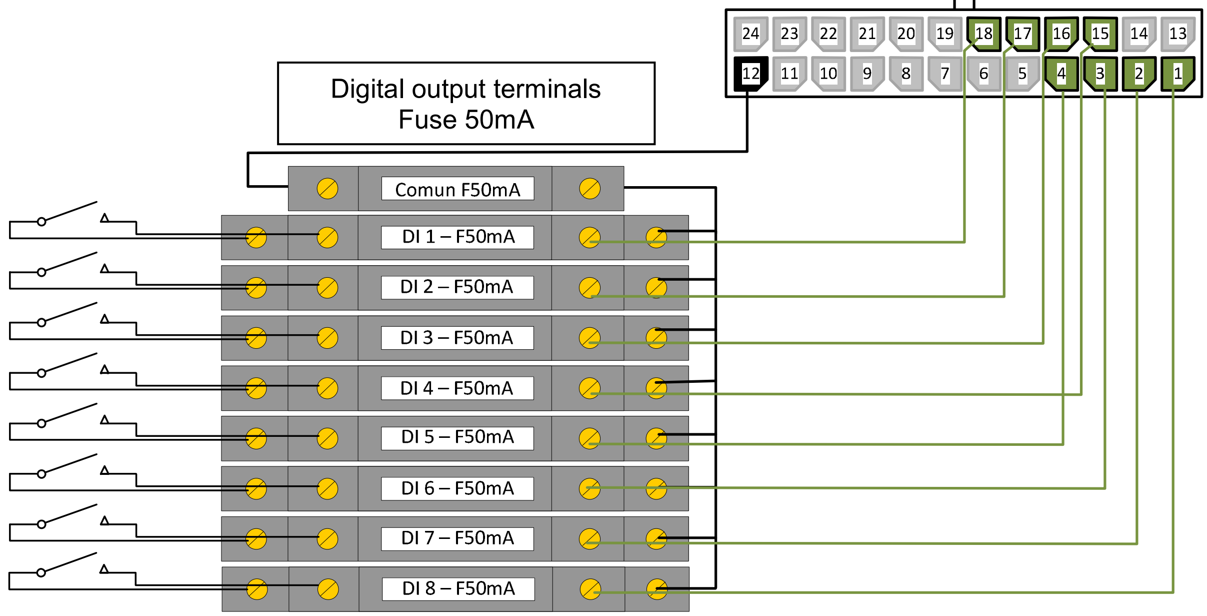
Pin	Name	Color	Comment
1	Digital input 1	green	0-50VDC
2	Digital input 2	green	0-50VDC
3	Digital input 3	green	0-50VDC alarm clock 200KΩ
4	Digital input 4	green	0-50VDC alarm clock 200KΩ
5	Digital output 1	Blue	opt coupler
6	Digital output 2	Blue	opt coupler
7	Digital output 3	Blue	opt coupler
8	Digital output 4	Blue	opt coupler
9	Analog input 1	Gray	0-15V, 12bit
10	Analog input 2	Gray	0-15V, 12bit
11	One Wire / %V	Orange	One wire temperature sensor / supports 5VDC
12	DGND	Black	Digital Earth
13	Relay output A	White	Relay output
14	Relay output B	White	Relay output
15	Digital input 5	green	0-50VDC
16	Digital input 6	green	0-50VDC
17	Digital input 7	green	0-50VDC alarm clock 200KΩ
18	Digital input 8	green	0-50VDC alarm clock 200KΩ
19	Analog input 3	Gray	4-20mA, 12bit
20	Analog input 4	Gray	4-20mA, 12bit
21	Micro RS232 TX	Yellow	Able for micro controller PIC
22	Micro RS232 RX	Yellow	Able for micro controller PIC
23	Ground	Black	Tierra Plug
24	VIN	Red	input voltage

5.2.1 Connection examples with field elements

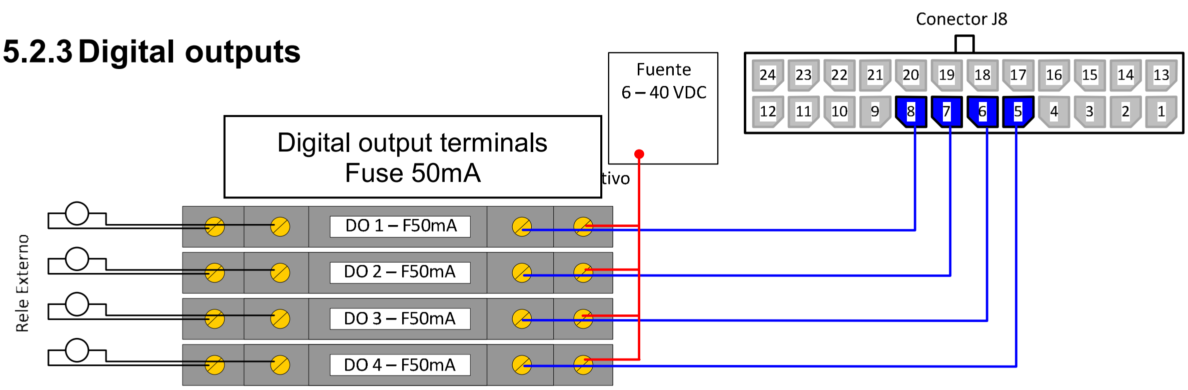
To protect the inputs and outputs it is necessary to put a 50mA fuse for each point and in the common point

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5.2.2 Digital inputs

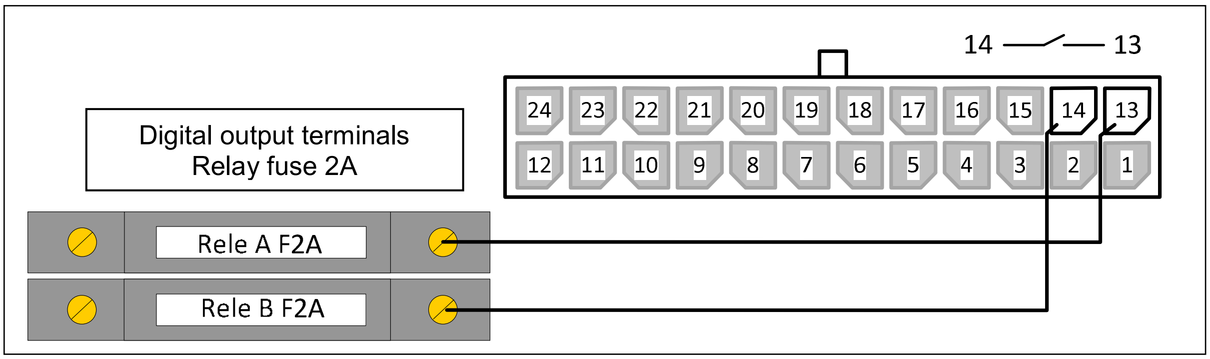


5.2.3 Digital outputs

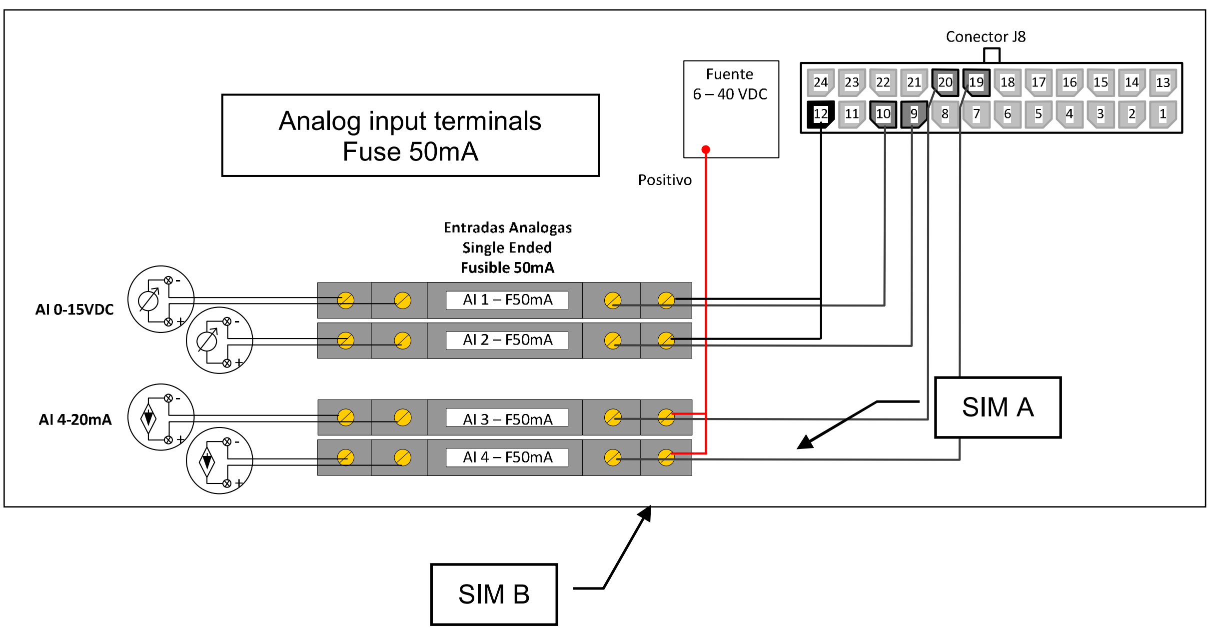


5.2.4 Internal Relay:

The unit is equipped with an internal relay supporting up to 2A for max 30VDC o ½A for max 120VAC



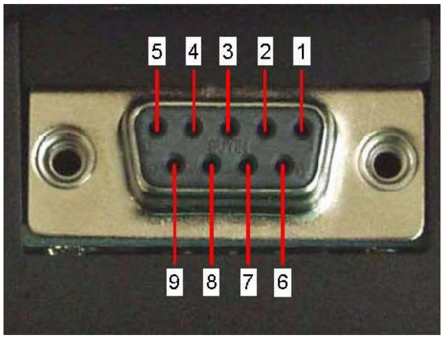
5.2.5 Analog inputs:



6. DB9 RS232 connector

The DB9 RS232 is used for serial communication and is connected to the linux processor

Pin	Name	Description
1		
2	RXD	Receive data
3	TXD	Transmit data
4		
5	Common	Common point
6		
7		
8		
9		



7. Sim card drawer

SIM cards can go in one drawer Push type located in the right side panel. is necessary to disassemble the DIN support to have access to the drawers.

Cajon de SIM



8. Mechanical characteristics

8.1 General mechanical characteristics

Weight	400g (14.1oz) 0.88 lb
Dimensions (max) L x W x H	100cm x 120mm x 30mm 3.93inch x 4.72 inch x 1.18inch
humidity	5% - 85%
Package material	Aluminum
IP grade of mechanical envelopment	IP40, avoid contact with liquids and humidity

8.2 Mechanical characteristics

Temperature ranges	**20°C to +55°C** **-4°F to 131°F**	The router is completely functional in any temperature following the ETSI specifications
	-30°C to +70°C **-22°F to 158°F**	The router is completely functional in all temperature ranges below -20°C up to+55°C (-4°F up to 131°F) slip form the ETSI specification..

8.3 RoHS compatability

All our HW follows EU RoHS y WEEE Directives.

9. Limited guaranty

VVAMIR guaranties to the original costumer that this device is free from defects in materials and workmanship for a period of one (1) year from the date of purchase.

This warranty does not apply if the product has been misused or has been damaged by accident, abuse, misuse or misapplied or has been modified without written permission.